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ANTONELLI, TERRY, STOUT & KRAUS, LLP			EXAMINER	
1300 NORTH SEVENTEENTH STREET			JACOBSON, MICHELE LYNN	
SUITE 1800				
ARLINGTON, VA 22209-3873			ART UNIT	PAPER NUMBER
			1794	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/517,630

Applicant(s)

FLACONNECHE ET AL.

Examiner

MICHELE JACOBSON

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1794

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-12 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-12 and 21-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 3-8 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis) with evidence provided by Ellis U.S. Patent Application Publication No. 2003/0049398.
3. Ellis teaches a permeation barrier fuel tank with an inner layer, middle nanocomposite polymer layer and an outer layer. (Para. 7) The nanocomposite middle layer is recited to be comprised of polyamide or ethylene vinyl alcohol copolymer in which platy filler material has been uniformly dispersed. The platy filler material is recited to have particles with a high aspect ration of about 200 to about 1000 where the thickness is on the order of one nanometer. (Para. 14) The presence of the platy filler material presents an efficient obstacle to the transport i.e. diffusion of penetrant molecules such as those normally found in fuels. (Para. 16) The barrier layer of the invention can be molded according to existing thermoforming methods such as extrusion, lamination etc. that are currently used for existing fuel tanks.
4. Ellis clearly anticipates the composition and fuel tank comprised of a polyamide layer with nanometric mineral material (Ellis: platy filler material) dispersed therein produced by extrusion recited in claims 3-8 and 12. It is well known in the adsorbent art

that platy material is synonymous with mineral materials as evidenced by Ellis U.S. Patent Application Publication No. 2003/0049398 where it is recited that "nanofiller" (also referred to as platy fillers) refers to these nanoscale constituents. A nanofiller generally comprises a filler material having a major diameter less than or equal to about 100 nanometers. Nanofillers are generally present in an amount of about 1 wt % to about 50 wt %, weight percent based on the total weight of a nanocomposite. Additionally, nanofillers generally have a surface area to thickness aspect ratio of about 50 to about 1,000. Common sources of nanofillers for polymers are found as naturally occurring smectite clays or layered silicates such as montmorillonite. Man-made nanofillers, such as synthetic mica are also available". (Para. 3) The platy nanofiller materials recited by Ellis are understood in the art to be comprised of mineral materials such as clays and silicates. Therefore, Ellis anticipates the limitation of a mineral filler set forth in claim 5. Since Ellis specifically recites that the platy material used is nanoscale in size, the nanometric type permeability reducing filler recited in claims 4 and 12 are anticipated. It is noted that while claim 5 recites a single layer for the wall of the container, the container is recited to comprise a single wall and therefore can be interpreted to include containers comprising several layers including the layer with the limitations recited.

5. Regarding claims 6 and 7: Claim 6 recites the limitation "wherein at least one face of said wall is treated ... to reduce the permeability". It is the examiner's opinion that adding platy nanomaterial to the polyamide of the barrier layer of Ellis is interpreted as treating the barrier layer to reduce permeability. Ellis therefore anticipates the

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limitations set forth in claim 6. Ellis clearly recites extrusion as a fabrication method as set forth in claim 7.

6. Regarding claim 8: Ellis clearly anticipates the application of the composite barrier material for fuel tank applications.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 5, 9, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis).

9. Ellis is silent regarding the use of the laminate recited for a fuel line and the dispersion of the platy filler material in the polyethylene layer.

10. Regarding claim 9: The examiner takes official notice that it is well known in the fuel containment art that structures that provide suitable barriers for fuel tanks would also provide suitable barriers for fuel lines. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the laminate structure recited by Ellis to fashion a fuel line. This obvious utilization of the structure of Ellis would have produced the invention as claimed in claim 9.

11. Regarding claim 21: Although Ellis recites that the platy material be dispersed in a layer of EVOH or polyamide, Ellis also recites that the outer layer of the fuel tank be comprised of polyethylene. It would have been obvious to one having ordinary skill in the art at the time the invention was made who desired to increase the barrier property of the external polyethylene layer to have added platy material to it as well, thus increasing the overall barrier properties of the fuel tank recited. This obvious modification would have produced a fuel tank with an inner polyethylene layer, a middle layer comprising EVOH or polyamide, and an outer layer comprising polyethylene and platy mineral material. This structure would have comprised a layer of polyethylene containing adsorbent mineral material as recited in claim 21.
12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis) as evidenced by Faulkner U.S. Patent No. 6,538,069 (hereafter referred to as Faulkner).
13. Ellis is silent regarding the platy nanomaterial recited being composed of talc, metal particles or clay.
14. Faulkner teaches a low permeability polymer compound. Faulkner provides evidence that it is well known in the polymer art that the term platy filler used to accomplish low permeability compositions is recognized to mean mineral materials such mica, talc or clay. (Col. 3, lines 9-12)
15. Both Faulkner and Ellis are directed towards polymer compositions with low permeability. As evidenced by Faulkner, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized talc or clay particles as

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the platy nanomaterials described by Ellis since these materials were well known to be platy nanomaterials capable of decreasing the permeability of polymer compositions. The use of these materials in the invention of Ellis would have produced the invention as claimed in claim 22.

16. Claims 2, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis) and Sikdar et al. U.S. Patent No. 6,117,328 (hereafter referred to as Sikdar)

17. Ellis teaches as has been recited above but is silent regarding the addition of zeolite, activated charcoal, carbon nanotubes or mixtures thereof to the permeation barrier layer recited.

18. Sikdar teaches an adsorbent filled membrane for pervaporation comprised of polymers such as polyethylene, polypropylene or polyamide with a hydrocarbon adsorbent such as activated carbon dispersed therein. (Col. 6, lines 58-65, Col. 7, lines 11-17) Zeolite based adsorbents are also recited to be dispersed in the polymer composition of the invention in addition to activated carbon. (Col. 7, line 16)

19. The motivation to combine Sikdar with Ellis would have been to further enhance the hydrocarbon adsorbing capability of the permeability reducing membrane of Ellis by the incorporation of additional adsorbent material.

20. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have added activated carbon or zeolite (which are inherently

micro- or nanoscale materials) to the platy nanomaterial filled layer of Ellis in order to further increase the barrier properties of the layer. This obvious improvement to the invention of Ellis would have produced the invention as claimed in claims 2, 10 and 11.

21. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ellis European Patent Number EP 1108598A2 (hereafter referred to as Ellis) and Coughlin et al. U.S. Patent No. 5,508,330 (hereafter referred to as Coughlin).

22. Ellis teaches what has been recited above but is silent regarding the fluorination of the interior surface of the tank.

23. Coughlin teaches that "Patented processes are known whereby the inner surface of plastic containers are modified by sulfonation or fluorination during or after the blow molding of the container. This treatment changes the surface characteristics of the polyolefin used to make the container so that the solvent is kept from wetting the inner surface. This prevents absorption and transmission of the solvent vapor through the container wall. The polyolefin is thus a barrier to either nonpolar solvents or aqueous solutions of active ingredient. Such containers can be used for herbicides, pesticides, gasoline, and other products that would normally penetrate polyolefin and would frequently be packaged in glass or metal."

24. Both Coughlin and Ellis are directed towards the improvement in barrier properties of molded articles. As recited by Coughlin, it was well known in the barrier material art at the time the invention was made to perform fluorination on the inside of containers means for holding gasoline. It would have been obvious to one having

ordinary skill in the art at the time the invention was made to have performed fluorination on the inside of the container recited by Ellis in order to further increase the barrier properties of the fuel tank. This obvious improvement to the invention of Ellis would have produced the invention claimed in claim 23.

Response to Arguments

25. Applicant's submission of a terminal disclaimer is acknowledged and the double patenting rejection previously set forth is therefore withdrawn.
26. Applicant's amendments of claims 3, 4, 6, 8 and 9 have been considered and are deemed sufficient for withdrawal of the rejection of these claims under 35 USC 112 set forth in the previous office action.
27. Applicant's amendments to claims 2-3, 5, 10 have been considered and are deemed sufficient for withdrawal of the rejection of these claims under 35 USC 102(b) over Sikdar set forth in the previous office action.
28. Applicant's arguments filed 5/8/08 have been fully considered but they are not persuasive. Applicant asserts on page 7 of the remarks that the mineral materials recited in the instant invention are selected to adsorb and to trap and amount of hydrocarbon discharged through the inner layer of the structure recited. Applicant further asserts that the platy filler material of Ellis is not disclosed to be a mineral filler not does Ellis disclose that the platy filler material is selected to adsorb and to trap hydrocarbons and that the platy material only presents an obstacle to the transport of fuel molecules. However, as enumerated above and evidenced by the secondary Ellis

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reference, it is the examiner's position that it is universally understood that platy filler materials are minerals. Applicant's assertion that the recitation of the platy materials providing an "efficient obstacle" to permeation of fuel molecules negates such materials acting as hydrocarbon adsorbers is spurious since the materials recited by Ellis would be interpreted by one of ordinary skill in the art to be the same as those claimed by applicant (i.e. talc and clay) and would therefore be expected to adsorb hydrocarbons. Additionally, applicant has failed to provide any evidence that the platy filler materials recited by Ellis would not adsorb hydrocarbons, nor has applicant put forth an alternative explanation for the success of such materials as additives for barrier layers. While Ellis does not specifically disclose adsorption, the prior art reference does not exclude adsorption as the mechanism by which the barrier layer functions. It is the examiner's opinion that it is well known in the barrier art (as evidence above by Faulkner) that platy filler material (i.e. talc and clay) adsorbs hydrocarbons.

29. Applicant asserts on page 8 of the remarks that since Sikdar is directed towards a pervaporation membrane and Ellis is directed towards a barrier layer there would be no reason to combine the teachings of the two references. While pervaporation may be concerned with the recovery of volatile compounds have they have been trapped, the materials used to trap the compounds provide efficient adsorption substrates for hydrocarbon compounds. The method of pervaporation utilizing activated charcoal requires a physical step such as heating to desorb the compounds from the adsorbent material used.(Sikdar, Col. 2, lines 25-31) One of ordinary skill in the hydrocarbon adsorbent art would have obviously recognized that activated charcoal materials useful

for the adsorption of hydrocarbons in pervaporation would be useful for the long term adsorption of hydrocarbons in many different applications where recovery of the hydrocarbon material or adsorption substrate material would not be necessary. The teachings of Sikdar are used in the context of what they recite about hydrocarbon adsorbing substrates. Since Ellis and Sikdar are directed towards materials capable of adsorbing hydrocarbons (Ellis-platy material, Sikdar-activated charcoal and zeolites) they are related prior art and the scope and content of the teaching of Sikdar are related to the invention disclosed by Ellis.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELE JACOBSON whose telephone number is (571)272-8905. The examiner can normally be reached on Monday-Thursday 8:30 AM-7 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michele L. Jacobson
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